Title: Methods and Apparatus for Efficiently
Transmitting Interactive Application Data Between a
Client and a Server Using Markup Language
Inventor(s):Mitchell, et al.
Serial No. Not Yet Assigned
Atty Docket No. CTX-036CN
Agent: David G. Miranda
Express Mail Mailing Label No. EV 012824605US

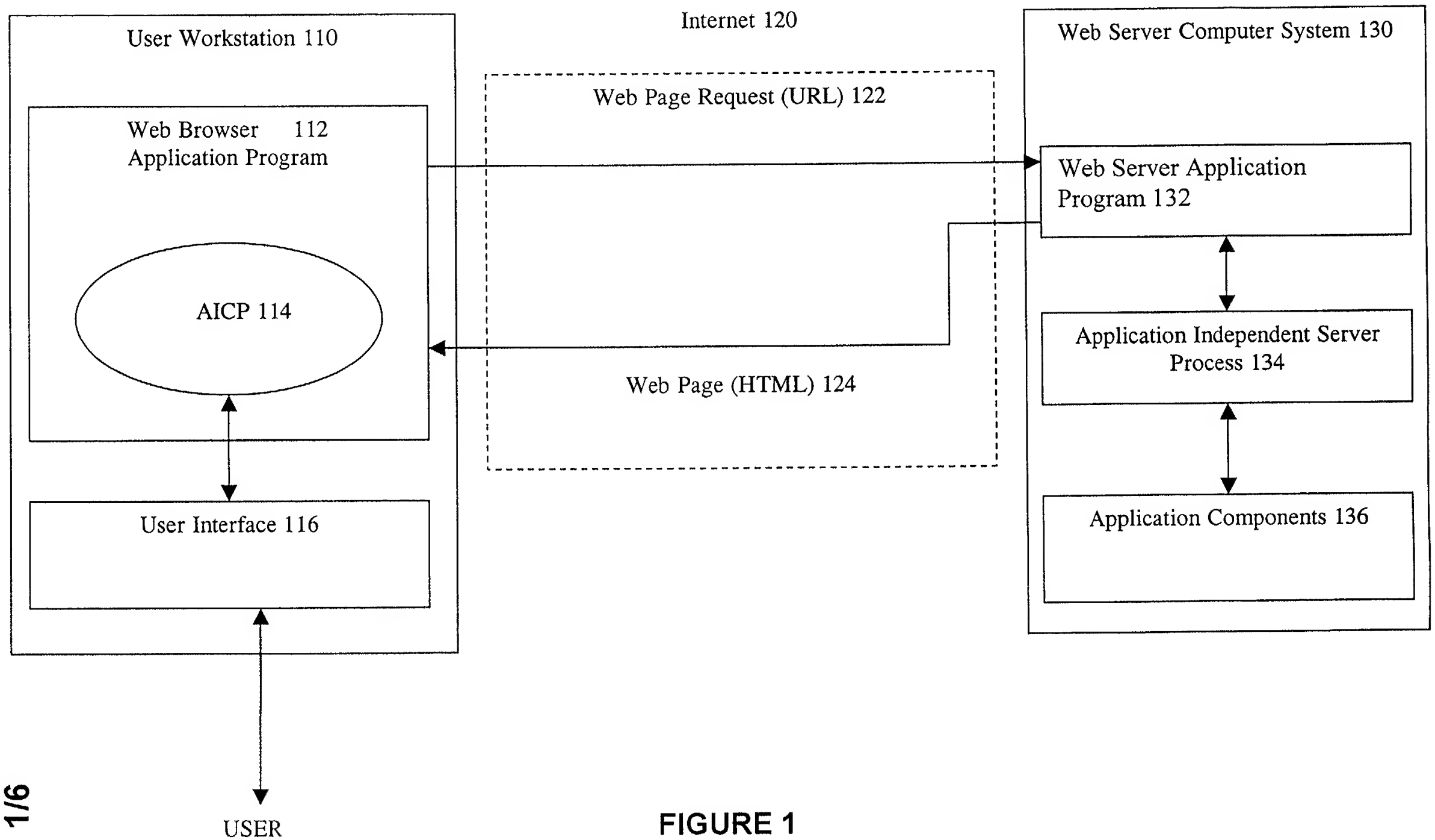
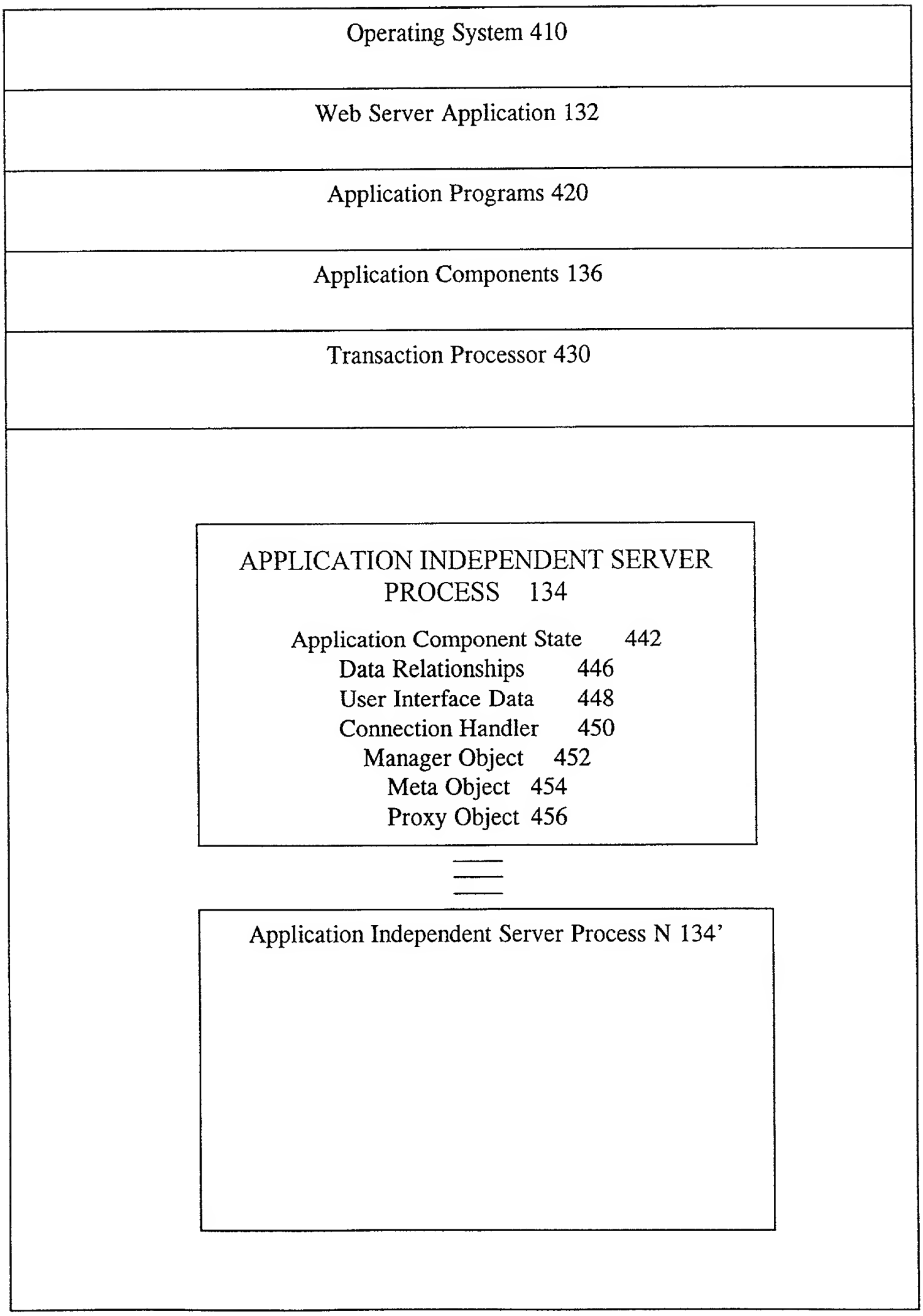





FIGURE 1

# FIGURE 2


Operating System 410
Web Server Application 132
Application Programs 420
Application Components 136
Transaction Processor 430
APPLICATION INDEPENDENT SERVER PROCESS 134
Application Component State 442
Data Relationships 446
User Interface Data 448
Connection Handler 450
Manager Object 452
Meta Object 454
Proxy Object 456
Application Independent Server Process N 134'

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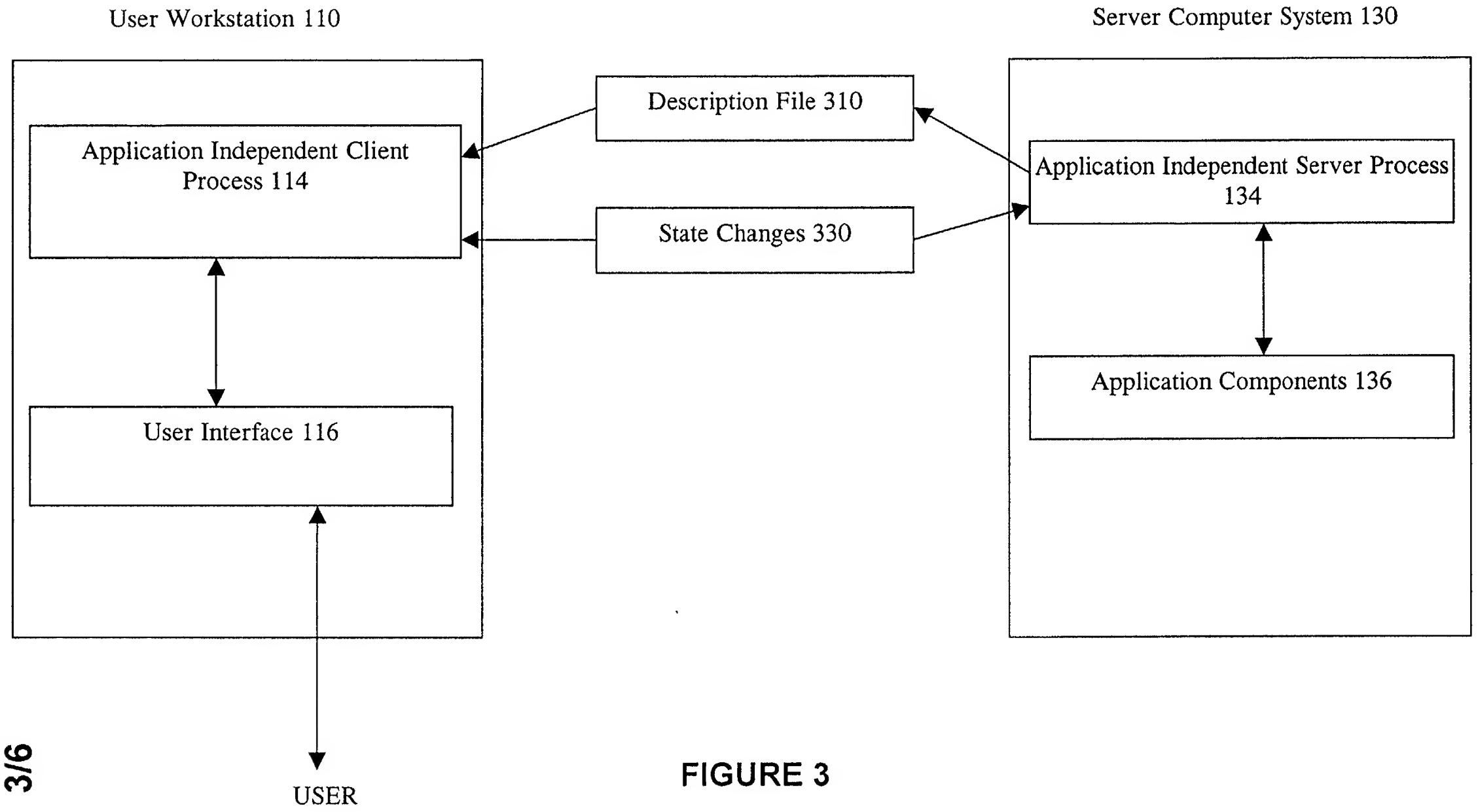




FIGURE 3

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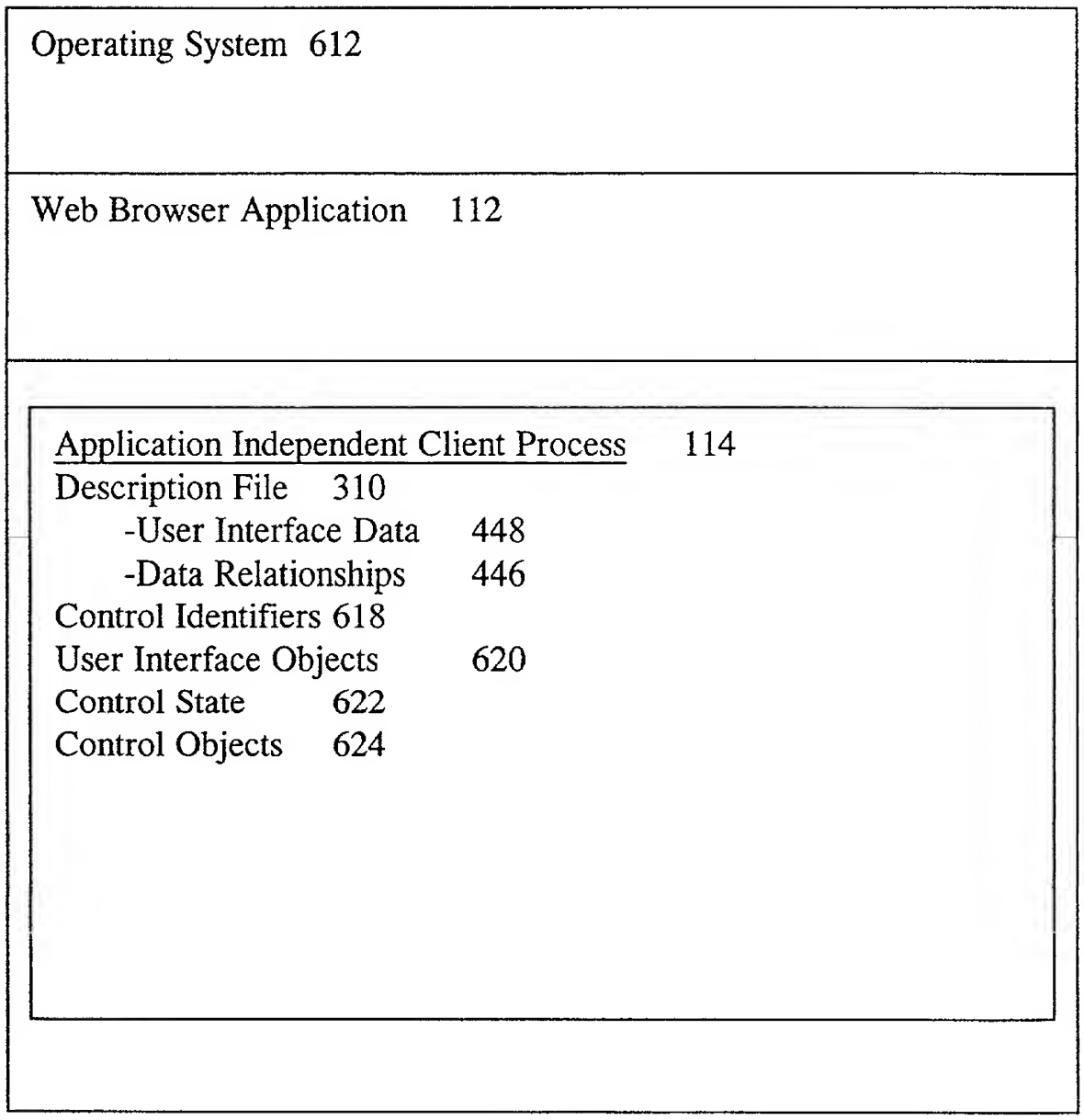
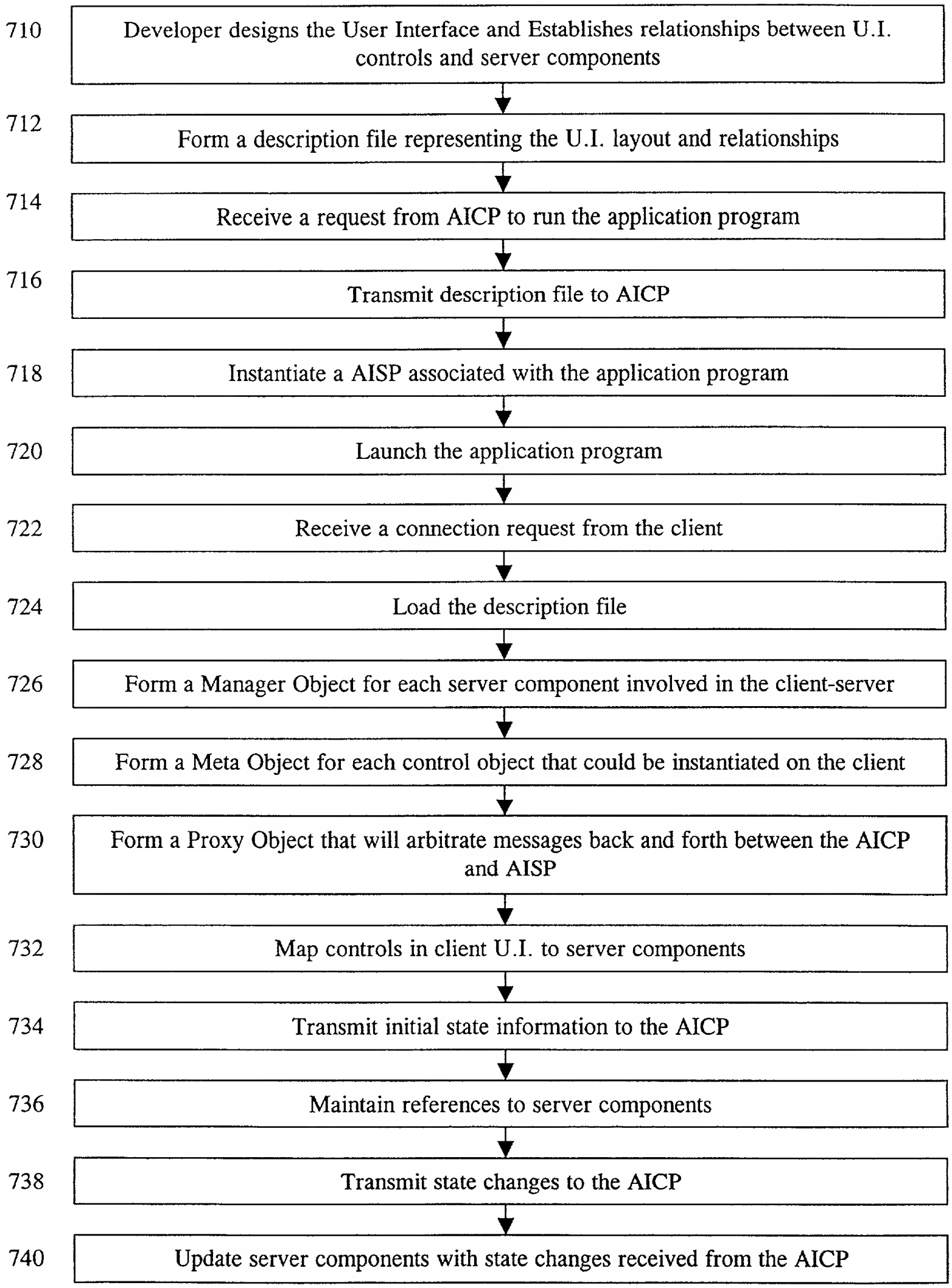
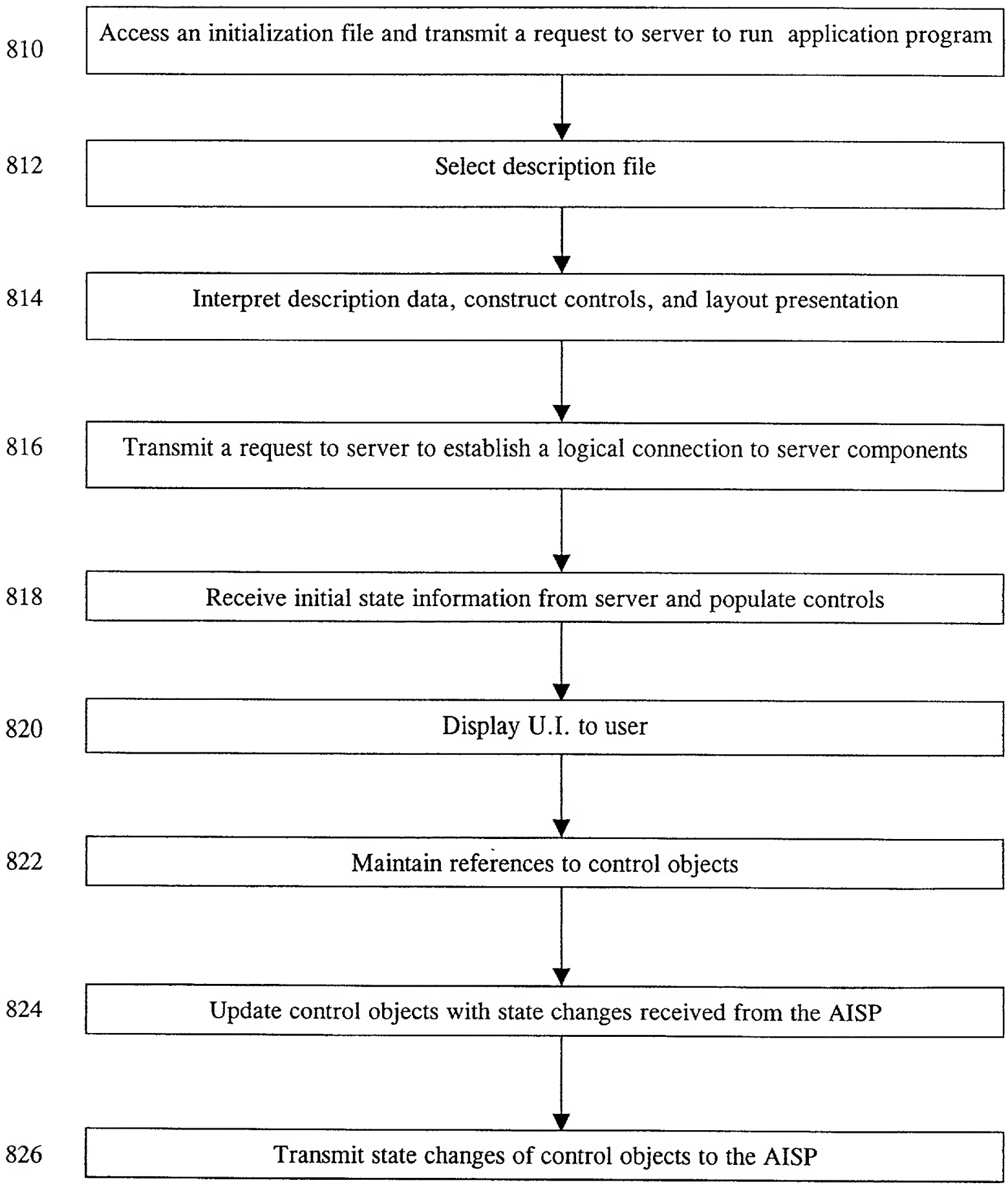
# FIGURE 4



# FIGURE 5


710
Developer designs the User Interface and Establishes relationships between U.I. controls and server components
712
Form a description file representing the U.I. layout and relationships
714
Receive a request from AICP to run the application program
716
Transmit description file to AICP
718
Instantiate a AISP associated with the application program
720
Launch the application program
722
Receive a connection request from the client
724
Load the description file
726
Form a Manager Object for each server component involved in the client-server
728
Form a Meta Object for each control object that could be instantiated on the client
730
Form a Proxy Object that will arbitrate messages back and forth between the AICP and AISP
732
Map controls in client U.I. to server components
734
Transmit initial state information to the AICP
736
Maintain references to server components
738
Transmit state changes to the AICP
740
Update server components with state changes received from the AICP

# FIGURE 6


810
Access an initialization file and transmit a request to server to run application program
812
Select description file
814
Interpret description data, construct controls, and layout presentation
816
Transmit a request to server to establish a logical connection to server components
818
Receive initial state information from server and populate controls
820
Display U.I. to user
822
Maintain references to control objects
824
Update control objects with state changes received from the AISP
826
Transmit state changes of control objects to the AISP